EXAMINATION

27 May 2015 (am)

Subject F102 — *Life Insurance* Fellowship Principles

Time allowed: Three hours

INSTRUCTIONS TO THE CANDIDATE

1. *Use the instructions and password provided at the examination center to log in.*

2. *Submit your answers in Word format only using the template provided.*

3. *Save your work regularly throughout the examination on the supplied computers' hard drive.*

4. *You have 15 minutes at the start of the examination in which to read the questions. You are strongly encouraged to use this time for reading only, but notes may be made.*
   You then have three hours to complete the paper.

5. *You must not start typing your answers until instructed to do so by the supervisor.*

6. *Mark allocations are shown in brackets on exam papers.*

7. *Attempt all eight (8) questions, beginning your answer to each question on a new page.*

8. *Candidates should show calculations where this is appropriate.*

Note: The Actuarial Society of South Africa will not be held responsible for loss of data where candidates have not followed instructions as set out above.

AT THE END OF THE EXAMINATION

Save your answers on the hard drive AND hand in this question paper.

In addition to this paper you should have available the 2002 edition of the Formulae and Tables and your own electronic calculator from the approved list.

QUESTION 1

You are the product manager for an insurance company which has a large book of income protection claims in payment.

i. Outline briefly the main features of an income protection policy.

[4]

ii. List the factors by which you would group the data and comment on the issues to be considered, when carrying out an investigation into the recovery component of claim termination rates.

[4]

You have completed your investigation and your rates differ significantly from the industry average.

iii. State reasons why your experience may differ from the industry experience.

[3]

[Total 11]

QUESTION 2

Insurers writing with-profits business, in a certain country, have traditionally followed the additions to benefits approach in order to distribute profits to policyholders. It is market practice to invest the assets backing with-profits business mainly in equities and to declare low reversionary bonuses and high terminal bonuses.

i. Outline briefly the factors that the insurer should take into account when considering the level of terminal bonuses to be declared in any given year.

[3]

ii. Describe in detail the gross premium valuation method for determining the supervisory reserves for with-profits policies.

[6]

There has been a market crash and a number of insurers have declared nil terminal bonuses for the year. This has resulted in a number of complaints from policyholders to the insurance regulator.

iii. State requirements that the regulator could put in place to reduce the risk of with-profits policyholders being, or perceiving to be, treated unfairly.

[2]

[Total 11]

PLEASE TURN OVER

QUESTION 3

A life insurance company has, for a number of years, sold, on varying terms, a single premium unit-linked endowment assurance product that has a guaranteed maturity value of R1 million. Based on the company's internal calculations the maturity value of such a policy (ignoring the guarantee) is estimated to have a normal distribution with mean of R1.3 million and standard deviation of R0.2 million. Assume that policies cannot be surrendered before maturity.

i. State the factors that would influence the statistical distribution of the maturity value.

[4]

ii. Calculate the probability that the maturity guarantee for such a policy will bite.

[3]

iii. Assuming that the underlying assets are invested passively in a fund matching a main local index, explain how the company can hedge its risk exposure arising from this guarantee.

[2]

[Total 9]

QUESTION 4

An established life insurance company has traditionally sold a wide range of protection and savings products to the upper- and middle-income market. The company plans to introduce a regular premium 15-year unitised with-profits savings product to be sold to lower-income government employees, marketed as a product to save for a child's tertiary education. The proposed features of the product are as follows:

- Maturity benefit: Accumulated premiums plus regular and terminal bonuses (bonuses may not be negative).
- Surrender benefit: Accumulated premiums plus regular bonuses less a surrender penalty and a market value reduction, if applicable.
- Partial withdrawal benefit: A maximum of two partial withdrawals after the first five years of the policy, of not more than 20% of the accumulated premiums plus regular bonuses.
- Death benefit: None, on the death of the policyholder the policy could be surrendered or be converted to paid-up unless there is a waiver of premium benefit as outlined below.
- Charges: Premium allocation rate, fixed per premium policy fee and an annual fund management charge.
- Optional benefit (for an additional premium): Waiver of future premium on death or permanent disability of the policyholder, with minimal underwriting required.

i. Outline the advantages of this savings product for targeted customers.

[3]

ii. Outline the risks that the insurer should consider when introducing this product.

[15]

[Total 18]

PLEASE TURN OVER

QUESTION 5

A popular product in a particular country is a regular premium, unit-linked savings product with a term of 10 years. The only permissible product charge is a level fund management charge. On surrender, a surrender penalty is deducted from the value of units. The maximum commission payable on the sale of such products, as prescribed in the insurance regulations, is a single upfront amount equal to twice the annual premium.

The regulatory authority is considering revising the insurance regulations for these savings products as follows:

- Disallowing any surrender penalties.
- Setting the maximum commission payable to:
  - ➢ an upfront amount equal to the annual premium; plus
  - ➢ a recurring amount of 10% of each regular premium (paid to the advisor on receipt of the premium in each year after the first).

The product design actuary has recommended the following changes to the design of the product to accommodate the changes in regulations:

- increasing the fund management charge from the current level of 2% p.a. to 4% p.a.; and
- refunding 50% of the charges deducted over the term of the contract on maturity (applicable only to the maturity benefit).

Discuss the suitability of the proposed changes to product design (including those required by the revised regulations), in terms of the relevant product design factors.

[10]

QUESTION 6

A life insurer selling regular premium without-profits endowment assurances has recently performed an experience investigation. The results of this investigation indicate that the insurer has had more surrenders at early durations than expected, and as a result it is making losses on surrenders. The insurer is considering making changes to its surrender value basis to minimise the negative impact of these early surrenders.

i. Describe a general approach to setting surrender values and suggest, with reasons, the approach this insurer might adopt.

[10]

ii. Explain how the assumptions for interest, expenses, inflation and mortality will be determined for the purpose of setting a prospective surrender value basis.

[5]

[Total 15]

PLEASE TURN OVER

QUESTION 7

You are a newly qualified actuary and have just been appointed as the actuary responsible for product development, pricing and reinsurance at a small mutual insurer in a developed country where HIV is not a concern to insurers. The insurer's Board of Directors has identified the need to aggressively grow the number of members to ensure the sustainability of the mutual. The mutual has decided that the best way to achieve this is to use the direct-to-consumer approach through the internet, selling a regular premium without-profit term assurance product.

i. Describe briefly the various ways in which a reinsurer could assist the mutual with this plan.

[4]

ii. Outline how you would structure the underwriting for this product.

[4]

iii. Explain how the pricing for this new product will differ from that for the regular premium without-profit term assurance product that the mutual currently sells through its own salesforce.

[4]
[Total 12]

QUESTION 8

i. Outline briefly eight main reasons for a life insurer to hold free assets (i.e. an excess of assets over liabilities).

[4]

A small but rapidly growing life insurance company with a strong free asset position has asked you, a life insurance consulting actuary, to explain to it the benefits of dynamic solvency testing.

ii. Define dynamic solvency testing, and outline the points you would make in your reply.

[5]

iii. Outline briefly the main considerations in deciding how the free assets should be invested for this insurer.

[5]
[Total 14]

END OF PAPER